

REMARKS

In an office action dated October 22, 2003, the Examiner objected to certain informalities in the Drawing; objected to a lack of antecedent basis in claim 12; rejected claims 1-2, 14, 20-21 and 33 under 35 U.S.C. §102(e) as anticipated by Ebrahim et al.(US Patent 5,905,998); rejected claims 3-4, 15, 22-23 and 34 under 35 U.S.C. §103(a) as obvious over *Ebrahim*; and rejected claims 9 and 28 under 35 U.S.C. §103(a) as obvious over *Ebrahim* in view of Boddu et al. (U.S. Patent 5,974,511). Claim 10-13, 16-19, 29-32 and 35-38 were objected to as dependent on a rejected base claim, but otherwise indicated allowable.

Drawing

Fig. 7 has been amended to include "Y" and "N" annotations on the branches from block S40. These paths are described at page 17 of the original Specification, and no new matter is introduced.

Specification

The first paragraph of the Specification has been amended to update the references to both parents to include the information that these are now issued patents. Applicants have further inserted a cross-reference to related application 09/862,486.

Indefiniteness

Claim 12 has been amended to correct lack of antecedent basis.

Prior Art

Applicants have re-written claims 10, 13, 29 and 32 in independent form, including all the limitations of the base claims from which they previously depended. Since these claims were objected to only as dependent on rejected base claims, they are now allowable. Claims 11, 12, 30

and 31 depend from claim 10 or 29, and are similarly allowable. Base claims 9 and 28 have accordingly been cancelled.

Applicants have amended claims 14 and 33 to include the limitations previously recited in dependent claims 18 and 37, respectively. Since claims 18 and 37 contained patentable subject matter and were objected to only as dependent on rejected base claims, amended claims 14 and 33 are now allowable. Claims 18 and 37 have accordingly been cancelled as superfluous. Some of the claim dependencies have also been amended, and claims 16 and 35 have also been cancelled as superfluous. Remaining claims 15, 17, 19, 34, 36 depend from claims 14 or 33, and are similarly allowable.

Independent claims 1 and 20 have been amended to include limitations previous recited in claims 4 and 23, respectively. Claims 3, 4, 22 and 23 have been cancelled as superfluous in light of the amendments. Although the Examiner rejected claims 4 and 23, as amended, the claims are patentable over the cited art, and this particular rejection is traversed.

In accordance with one aspect of applicants' invention, when a certain type of invalidation command (e.g., a kill command) requesting invalidation of a cache line is received at a processor, and the processor's cache has such a cache line containing modified data, a cast back command is temporarily put in the transition cache. The transition cache then waits for the system response to the invalidation command. If the system response is normal completion, then the data must be discarded to maintain coherency. But if the system response is a retry, then it is possible to cast back the modified cache line to main memory.

Ebrahim discloses only that, in similar circumstances, the cache line is discarded (i.e, the first part of the response). *Ebrahim* does not disclose any capability to cast back the modified cache line to memory if the invalidation command does not complete.


The Examiner reasons that it would have been obvious to extend *Ebrahim* to applicants' claimed invention, based on *Ebrahim*'s statement that a dirty victim is normally written back, except that the write back is canceled if the same data block is invalidated *before the writeback becomes effective*. But this is just the point at which applicant's invention provides an advantage over the prior art. Prior art systems assume, as does *Ebrahim*, that if the data block is invalidated, write back is impossible. However, in accordance with applicant's invention, the data block can still be invalidated, and yet written back. This is so because applicant teaches storing the write back temporarily in the transition cache, and checking to make sure that the invalidation command actually completes. If the invalidation command does not actually complete, then it is possible to write the invalidated data back to memory, *notwithstanding that it has already been invalidated in the cache*. *Ebrahim* does not teach or suggest such a feature. Rather than suggest this capability, the sentence quoted by the Examiner teaches away from it by stating "except that...the write back can be canceled if the same data block is invalidated..." The clear implication is that, in these circumstances, no write back occurs.

Finally, *Ebrahim* does not disclose any mechanism whereby modified and invalidated data can be stored in a transition cache pending a determination whether the invalidation command actually completed normally. The lack of any such mechanism is further evidence that *Ebrahim* does not teach or disclose the claimed feature.

For all of these reasons, amended claims 1 and 20 are neither taught by, nor obvious over, *Ebrahim*, and are patentable. Claims 2 and 21 are dependent on claims 1 and 20, and likewise patentable.

In view of the foregoing, applicants submit that the claims are now in condition for allowance and respectfully request reconsideration and allowance of all claims. In addition, the Examiner is encouraged to contact applicants' attorney by telephone if there are outstanding issues left to be resolved to place this case in condition for allowance.

Respectfully submitted,
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